Unit 6

Regular Maintenance of Transmission System

As we already know a vehicle is operated with an engine. The mechanism that transmits the power developed by the engine to the driving wheel is known as the transmission system. It is also called power train. This system contains components, such as clutch, gearbox, propeller shaft, differential unit, etc.

The transmission system of a car should be checked regularly for fluid level, filter, etc., for smooth operation of a vehicle.

In this Unit, you will develop an understanding of the role of the transmission system and its maintenance.

SESSION 1: TRANSMISSION SYSTEM

The entire mechanism that transmits power from the engine to the wheel is known as the transmission system. It is also called power train. This system contains the following components, which are given below with their functions.

Clutch

The clutch engages and disengages transmission from the driving member or shaft to the driven member, which assists the gradual engagement and disengagement

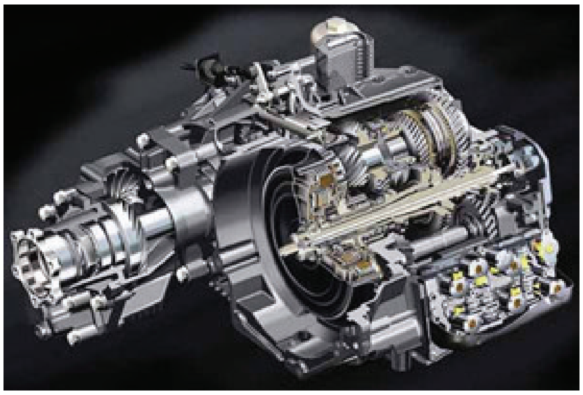

Fig. 6.1: Gearbox

in transmission of power. In the engaged position, a clutch must transmit the total engine torque to the gearbox.

Gearbox or Transmission

Gearbox is a part of the transmission system as the gears play an important role in transmitting the engine power to the wheels and overcoming resistance like gradient resistance, air resistance and load resistance. Gears is placed between the clutch and propeller shaft or differential.

Propeller Shaft

To transmit the power with variation of the angle and variation in length in relation with front and rear axle, the propeller shaft is used; this is connected between gear box and final drive.

Differential Unit

The differential is a device that allows each of the driving wheels to rotate at different speeds, when the car turns a corner. In vehicles without a differential, both driving wheels are forced to rotate at the same speed, usually on a common axle driven by a simple chain-drive mechanism.

Cleaning of motorcycle driving chain

To increase the life of sprockets and driving chain rollers, it is necessary to follow the given sequence for cleaning the driving chain

- Remove the chain cover from the motorcycle.
- Turn the wheel and using a nose plier, remove the chain lock.
- Take out the chain from both the sprockets.
- Using diesel, thoroughly clean the chain and sprockets.
- Now, wipe the chain and place it in SAE 90 grade lubricating oil.
- Now place the chain on the sprockets.
- Slowly turn and check for free rotation.

Fixing a loose chain

- Loosen the rear wheel axle nut and the crushed drive plate nut.
- Tighten the adjusting nut equally on both the sides, wheel will turn backwards and the chain will become tight.
- There must be slackness of 8–10 mm, because while riding the chain will be stressed.

Practical Exercise

1. Identify and locate the different units of transmission system and fill the table.

S. No.	Name of the component	Function

Check Your Progress

A. Fill in the blanks

1. _______________ and _______________ are the components of transmission system.
2. Propeller shaft helps _______________ in an engine.
3. Function of differential unit is to ____________.

B. Multiple choice questions

1. Which system transmits power from the engine to the wheel?
   (a) Transmission system
   (b) Fuel supply system
   (c) Power supply system
   (d) Ignition system
2. What assists the gradual engagement and disengagement in transmission of power?
   (a) Clutch
   (b) Gearbox
   (c) Crankshaft
   (d) None of the above

3. Gear box is placed between __________________________.
    (a) clutch and propeller shaft or differential
    (b) rear axle and engine
    (c) connecting rod and crank shaft
    (d) None of the above

C. Answer the following questions

1. What is the importance of a transmission system?
2. Give the difference between clutch and gear.

SESSION 2: CLUTCH MAINTENANCE AND ADJUSTMENT

Clutch Maintenance

Like the care for most automotive components, a key aspect of clutch maintenance is reducing the amount of heat that it is exposed to. It is important to avoid situations where the clutch is partially engaged — like 'riding' the clutch between gearshifts — to reduce the amount of heat generated by internal friction. Operate the clutch lever or pedal and see, clutches fully disengage transmission of power from an engine.

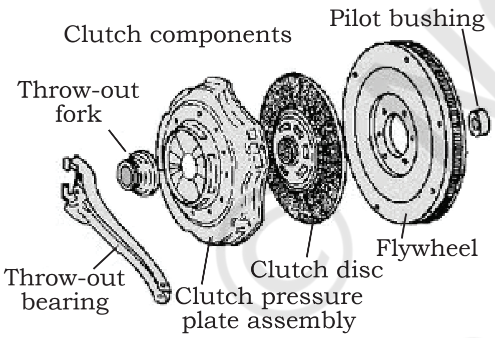

Fig. 6.2: Clutch

When the clutch is engaged, ensure that it transmits the power completely without any slippage. For this purpose, there should not be any pivot friction in control cable connection or in clutch linkage. At regular intervals, clean and lubricate the linkage points and joints. Also tighten the slacken nut and fasteners to specified torque and ensure friction free movement of the clutch mechanism.

Clutch Adjustments

For the smooth functioning of the clutch, the following adjustments must be carried out.

Free Play Adjustments (Two-wheelers)

- First check the free play of clutch lever, which should be 10–12 mm. If the free play is incorrect, then adjust.
- Stretch the outer cable or sleeve by loosening the locknut. Then turn the tubular screw (adjustment

unit) anti-clockwise to reduce the free play and clockwise to increase the play.

- If the clutch play is not able to adjust by stretching of the outer cable then adjust the play by tightening the inner cable attachment with the clutch near gear box.

Free Play Adjustments (Four-wheelers)

The adjustment depends on the make of the four-wheeler. The clutch free play for four-wheelers is generally 15–20 mm at the clutch pedal. If the free play is less or more than the specified limit, it should be adjusted in the following way (for heavy vehicles)

- Loosen the lock nuts on both sides of turn buckle.
- Rotate the turn buckle according to the requirement to adjust the required play at the clutch pedal.
- After adjustment, tighten the lock nut.

Clutch Pedal Travel Adjustment

Follow the steps given below to check clutch pedal travel adjustments:

- Operate the clutch pedal and inspect it.
- The clutch pedal must move freely on the floor board.
- Carry out the necessary adjustments by adjusting the clutch linkages and adjustable sleeves.

Inspect Power Transmission from Clutch Assembly

Follow the steps given below to inspect power transmission from clutch assembly:

- Start the engine and run at idle speed.
- Now operate the clutch and check variation in noise
- Then engage the gears and slowly release the clutch.
- Notice for smooth transmission power without any jerky movement.
- Shift the next gear, check for the smooth sifting and hundred percentage transmission of power.

Practical Exercise

1. Identify and locate the different components of clutch.

Sr. No.	Name of the component	Function

Check Your Progress

A. Fill in the blanks

1. Clutch is used for ____________ and _____________ power.
2. The clutch free play for four-wheelers is generally ______________.
3. Clutch unit is fixed between _______________ and _____________.

B. Multiple choice questions

1. A clutch must also transmit total engine _____________.
   (a) torque
   (b) power
   (c) fuel
   (d) resistance
2. In a two-wheeler first check the free play of clutch lever, which should be ________________.
   (a) 10–12 mm
   (b) 50–60 mm
   (c) 100–150 mm
   (d) None of the above
3. Stretch the outer cable or sleeve by turning the tubular screw (adjustment unit) anti-clockwise to ______________.
   (a) reduce the free play
   (b) increase the free play
   (c) neutralise free play
   (d) None of the above
4. The clutch free play for four-wheelers is generally _________________ at the clutch pedal
   (a) 15–20 mm
   (b) 20–30 mm
   (c) 40–50 mm
   (d) None of the above

C. Answer the following questions

1. What is the importance of clutch?
2. What are the effects of binding in clutch?

NOTES